

## the consilient observer

applying cross-discipline frameworks to investing

con · sil'i · ence, n. [con- + salire to leap]  
con sil'i · ence, n. [con- + salire to leap]  
interlocking explanations of cause and effect between disciplines  
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# A Process for Outperformance

## Thoughts on Organizing for Investing Success

*The more that you read,  
the more things you will know.  
The more that you learn,  
the more places you'll go.*

Dr. Seuss  
*I Can Read With My Eyes Shut!*

### Ant Brain

In the fall of 2000, we gathered a small group of leading investors to hear from various finance, strategy, and business luminaries. While these presenters were terrific on balance, none got the award for creating the most buzz. That honor went to Los Alamos National Laboratory scientist Norman Johnson, who opened his talk in a seemingly inauspicious way: "I've been asked here to talk about what's wrong with experts—as an expert in this area—in a subject area, finance, that I know almost nothing about."<sup>1</sup>

What did Johnson say to cause these smart investors to slide forward in their chairs? Simply put, he showed how diverse groups of "average" people, acting together, solve problems better than experts do. Johnson illustrated his point by discussing the behavior of social insects, including ants and bees. It was the incredible performance of these insects, above all, that sparked the imaginations of the listeners.

Most of Johnson's talk was at the macro level, or how the collective solves problems. This has obvious relevance for understanding how market efficiency arises.<sup>2</sup> Our focus here is on the micro level or how investors, *as individuals*, should organize for investment success. While the unit of analysis is different, the message is the same: diverse information and perspectives can help improve investment performance.

Now think carefully for a moment about your information sources. Do you read the same newspapers, talk to the same people, and review the same type of research reports over and over? Or do you allocate time to entertain new ideas, even at the risk of wasting time on intellectual cul-de-sacs? There is strong evidence to suggest that the leading thinkers in many fields—not just investing—benefit from input diversity.

### A-Mazing

Before we dwell on the individual, we would like to show how diversity leads to better answers and how a lack of diversity can create inefficiencies. Johnson demonstrates how the collective is better than the average individual with a maze problem:

- First, he asks individuals of identical capabilities to solve a maze. Because the individuals have no global sense of the problem, they simply explore until they find a solution.

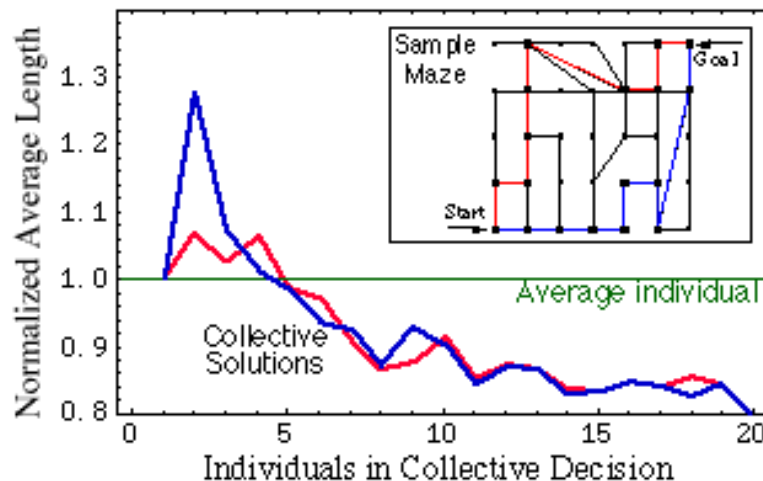
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- Next, he asks the individuals to solve the problem again. With some learned information, they tend to improve.
- Finally, he constructs a linear combination of each individual's experiences and uses the same rules to find a collective solution.

Because each individual's initial search is random, a collection of individuals reflects diverse experience (maze regions), preferences (preferred paths), and performance (path lengths).<sup>3</sup> So the collective is really just a normal individual with super information. Because of this diverse information, the collective solution is vastly more robust than average individual solution. (See Figure 1.)

**Figure 1**  
**The Collective Beats the Individual**



The insert in the figure shows the demonstration maze. The main figure shows the effect on the collective solutions as more individuals contribute to the collective solution, for two different sets of random numbers. The number of steps of the collective is normalized by the average number of steps of the individuals contributing to collective solution.

Source: Norman L. Johnson. See <http://www.ishi.lanl.gov/symintel.html>.

The power of this collective effect has not been lost on nature. This is where Johnson's stories about ants come in. How do the ants do it? Foraging ants depart the nest with one job in mind, to find and retrieve food. They also have the ability to leave and follow chemical trails. At first, they disperse randomly. When the ants that find food come back to the nest, they leave a chemical trail that their sisters can follow. Studies show that this process allows ants to consistently find the shortest path to the food.<sup>4</sup>

Once researchers understood this collective ability, they decided to play a trick on the ants. In a controlled setting, the scientists placed two food sources at identical path lengths from the nest. As it turned out, the ants ended up using just one of the paths, although which one they chose was random. Why? Because they follow chemical trails, a couple more ants going down one path will attract other ants, triggering a positive feedback loop. So instead of finding an optimal solution, the ants have one crowded path and an equidistant, empty path.

Amazingly, though, nature anticipated this problem as well. As it turns out, ants periodically break from the main path and begin a random search process again. The ants are programmed to strike a balance between exploiting a known food source and exploring for the next food source. (See Figure 2.) Johnson calls this the "wild hair" alternative. The ants are hard-wired to seek diversity.

**Figure 2**  
**The Wild Hair Alternative**

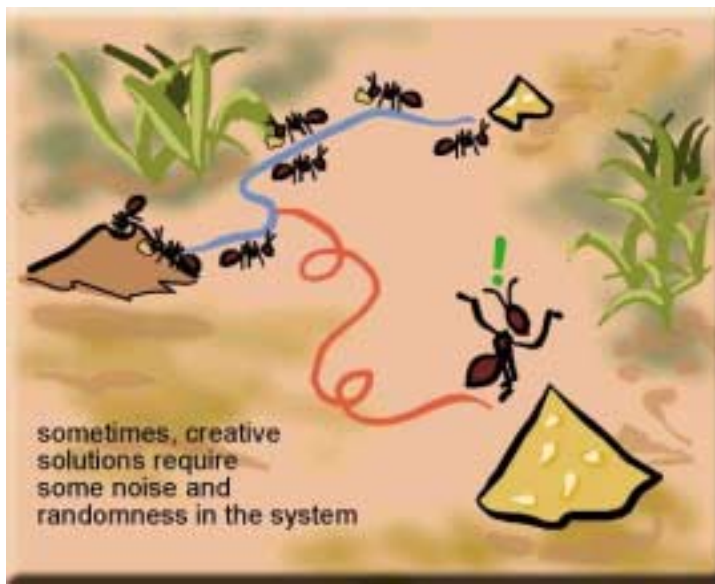


Illustration by Sente Corporation. [www.senteco.com](http://www.senteco.com)

## Getting a Diversity Degree

What do mazes and ants have to do with the challenging job of managing money? A lot, as it turns out. Physiologist Horace Barlow says that intelligence is all about making a guess that discovers some new underlying order. This includes solving a problem, seeing the logic of an argument, or finding an appropriate analogy.<sup>5</sup> Where does investment intelligence come from?

Here is where Norman Johnson's message is so important for investors. In well defined systems, experts are useful because they can provide rule-based solutions. But when a system becomes complex, a collection of individuals often solves a problem better than an individual—even an expert. This means that the stock market is likely to be smarter than most people most of the time, a point the empirical facts bear out.

To be an expert in a complex system like the stock market, he continues, you need two essential features. First, you must be able to create a "simulation" in your head, allowing you to conceive and select strategies.<sup>6</sup> A description of the legendary hedge fund manager George Soros illustrates the point:

"[Gary] Gladstein, who has worked closely with Soros for fifteen years, describes his boss as operating in almost mystical terms, tying Soros's expertise to his ability to visualize the entire world's money and credit flows. 'He has the macro vision of the entire world. He consumes all this information, digests it all, and from there he can come out with his opinion as to how this is going to be sorted out. He'll look at charts, but most of the information he's processing is verbal, not statistical'."<sup>7</sup>

Second, you must populate your mental system with information from diverse sources. While the ability to simulate may be largely hard-wired (although you can improve your skills in this area), the pursuit of diverse ideas is within your control.

Psychologist Donald Campbell describes the situation in similar terms, referring to the process of creative thinking as "blind variation and selective retention." In other words, creative thinkers seek a variety of ideas, but only choose those that are useful given their current goals.

Idea diversity allows you to find what Johnson calls "weak signals." A weak signal may be the start of a trend that's away from the dominant path (think new technology or development), or the right piece of information at the right time from an unexpected source. In fact, a recent study suggests that informal learning fulfills up to 70% of learning needs inside some organizations.<sup>8</sup> It's often difficult to know where the next beneficial idea will come from. The

evidence suggests that exposure to diverse information sources can improve the likelihood of finding a useful idea.

## Creativity and Investing

In a classic article, former Merrill Lynch Asset Management president Arthur Zeikel argued that superior investment performance requires key personnel within the firm to be creative.<sup>9</sup> He suggested that creative people are:

- Intellectually curious
- Flexible and open to new information
- Able to recognize problems and define them clearly and accurately
- Able to put information together in many different ways to reach a solution
- Antiauthoritarian and unorthodox
- Mentally restless, intense, and highly motivated
- Highly intelligent
- Goal-oriented

Diversity is the fuel for many natural and cognitive processes. Investors that have investment approaches, or information sources, that are too narrow risk missing out on the power of diversity. The downside, of course, is that entertaining diverse ideas means sorting through lots of potentially useless input. But on balance diversity seems to enrich the investment performance—and the lives—of thoughtful investors.

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<sup>1</sup> Michael J. Mauboussin, "Thought Leader Forum: Connect to the Idea Frontier" *Credit Suisse First Boston Equity Research*, 2001, 64-81.

<sup>2</sup> Michael J. Mauboussin, "Revisiting Market Efficiency: The Stock Market As A Complex Adaptive System" *Journal of Applied Corporate Finance*, 14, 4, Winter 2002, 8-16.

<sup>3</sup> Norman L. Johnson, "Diversity in Decentralized Systems: Enabling Self-Organizing Solutions, LANL, LA-UR-99-6281, 1999. For more on this, see <http://ishi.lanl.gov>.

<sup>4</sup> James Kennedy and Russell C. Eberhart, *Swarm Intelligence* (San Francisco, CA: Morgan Kaufmann Publishers, 2001), 105.

<sup>5</sup> William H. Calvin "The Emergence of Intelligence" *Scientific American Presents*, 9, 4, November 1998, 44-51. <http://www.sciam.com/1998/1198intelligence/1198quicksummary.html>

<sup>6</sup> Gary Klein, *Sources of Power: How People Make Decisions* (Cambridge, MA: MIT Press, 1998).

<sup>7</sup> Michael T. Kaufman, *Soros: The Life and Times of a Messianic Billionaire* (New York: Knopf, 2002), 141.

<sup>8</sup> See <http://www.learning-org.com/98.01/0331.html>.

<sup>9</sup> Arthur Zeikel, "Organizing for Creativity" *Financial Analyst Journal*, 39, November/December 1983, 25-29.



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